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279

Notified in
A.C.Is. for the
week ending
6th March
1940



Small Arms Training

Volume I, Pamphlet No. 7—1939

•303-inch Machine Gun

SUPPLEMENT

(The Clinometer and Bar Foresight)

ORDERLY ROOM

1940

DATE

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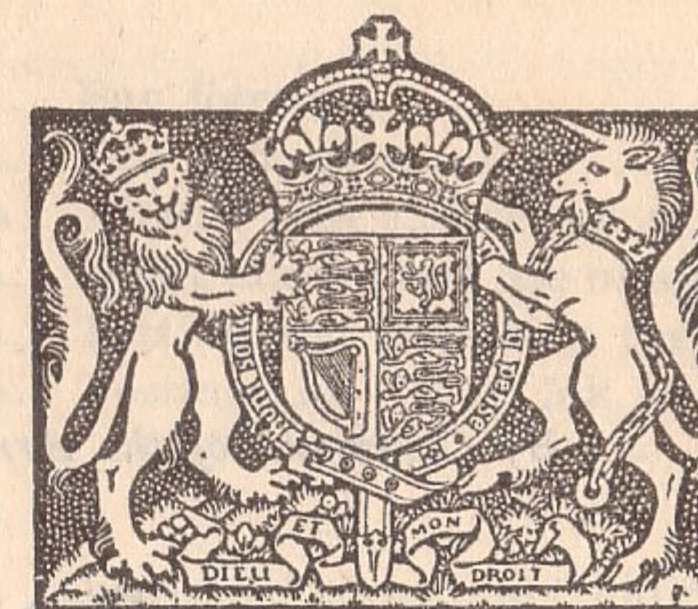
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By Command of the Army Council,

I. J. G. G.

THE WAR OFFICE,

1st March, 1940.

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PART I

S.A.T., VOL. I, PAMPHLET 7, 1939, SUPPLEMENT

(The clinometer and bar foresight)

NOTE.—Until dial sights are issued, training will be carried out in the use of the clinometer and bar foresight. The lessons in this supplement should be substituted for those in S.A.T. Vol. I., Pamphlet 7.

LESSON 30A.—BAR FORESIGHT

Instructor's Notes

Stores :—Gun, tripod, bar foresight.

Explain and demonstrate the following :—

1. The graduations on the bar, the pointers, and the markings R. and L.

The graduations on the upper surface of the bracket.

The sliding sight and clamp screw.

The clamping screw on the bracket.

2. To affix the bar foresight.

Gun mounted, No. 2 kneeling on the right of the gun with bar foresight in pouch, slung over left shoulder.

No. 2 will remove the bar foresight from the pouch, seeing that it is set at zero. He will place it over the foresight protecting wings of the gun, and, being careful that the spring stud engages on the opening on the right wing, will tighten up the clamp screw on the bracket.

3. To lay off an angle of direction with the bar foresight.

Gun mounted, with bar foresight affixed, and laid on an aiming mark. No. 2 at the gun.

No. 2 will adjust the bar foresight in accordance with the deflection given.

It should be noted that the sight is moved in the opposite direction to that ordered, *i.e.* if *right* is ordered the sliding sight is moved to the *left*.

Adjustments will be made to the nearest 10 minutes. When the bar foresight is replaced in its pouch, it will be set at zero.

LESSON 31A.—THE CLINOMETER

Instructor's Notes

Stores :—Gun, tripod, clinometer.

Explain and demonstrate :—

1. The graduations on the cradle and micrometer collars. Method of adjustment by milled head and quick release. The arrow on the base.

2. To place elevation or depression on the gun by means of the clinometer.

Gun mounted approximately level. No. 2 kneeling on the right side of the gun, clinometer in case, set at zero, slung over the left shoulder.

No. 2 removes the clinometer from its case and sets it at the angle ordered. He places it, *with the arrow to the front*, on the side plates of the breech casing of the gun. It should be placed so as not to foul either the trigger bar lever, or the tail of the trigger. By moving the hand wheel, No. 2 centralizes the spirit bubble.

The clinometer will be set at zero when it is no longer required. At other times it will be left at the setting ordered. Elevations will be given to the nearest five minutes.

3. To ascertain the quadrant elevation on the gun.

Gun mounted and laid at any angle of elevation or depression. No. 2, kneeling on the right side, with clinometer set at zero.

No. 2 places the clinometer on the side plates of the breech casing, *arrow pointing to the front*. He turns the milled head until the bubble is central, removes the clinometer and takes the reading.

Lessons 32-34 do not apply.

Lessons 35 and 36 remain as at present.

LESSON 37A.—AIMING POST AND ZERO POST, MARK I

Instructor's Notes

Stores :—Gun, tripod, bar foresight, aiming post, zero post.

1. Aiming post, Mark I (Mark III is described in Pamphlet 7, Lesson 37).

i. Explain and demonstrate :—

The telescopic portion.

The collar on the inner rod.

The bracket.

That when used in conjunction with the clinometer and bar foresight, an aiming post is required for each gun.

ii. To plant the aiming post when used with bar foresight.

The gun will be mounted and laid with any quadrant angle. The bar foresight will be affixed. No. 1 at the gun, No. 3 a few yards in rear with aiming post.

No. 1, without moving the gun, runs the tangent sight up to 2,500 yards (this range applies either for a Mark VII or a Streamline back sight leaf). No. 3 moves up to the gun and looks over the sights to ascertain the approximate position for the aiming post. He will then plant the post not less than 5 yards in front. No. 1 will direct No. 3 by signal to move the post until the line of sight is at 6 o'clock on the aiming mark.

(Mark I Aiming Post.) No. 3 should place the aiming post on the ground, or plant it vertically. If this is not possible, the foot of the post should be driven firmly into the ground sufficiently far to one side to admit of full use being made of the telescopic portion.

(Mark III Aiming Post.) No. 3 should lay the post on its side, with the flat side of the base and the securing extension on the ground. If this is not possible, he will plant it vertically, making final adjustment with the folding arm.

2. Zero post.

For description, *see* Pamphlet 7, Lesson 37, 2.

To plant zero post.

Gun mounted and laid with any quadrant angle, bar foresight affixed. No. 1 at the gun, No. 3 a few yards in rear with the zero post. The instructor may act as the No. 1.

Nos. 1 and 3 act in the same manner as when planting the aiming post.

The zero post will be planted so that the line of sight is on the point where the ring joins the stem. If it cannot be planted upright it will be planted leaning sideways.

LESSON 38A.—NIGHT AIMING AND USE OF AIMING LAMP

Instructor's Notes

Stores :—Gun, tripod, night sights, aiming post, night aiming lamp.

1. Night aiming.

i. Description of night sights.

(a) The night sights are carried in the aiming lamp box.

(b) Explain the method of attaching the night foresight.

(c) Explain method of attaching, and features of, the night backsight.

ii. To lay an aim with the night sights.

(a) Instruction in aiming with the night sights will be carried out in the sequence given in Lesson 29, 3, i to iii. The aim with night sights will always be taken at a bull's eye.

(b) The No. 1 will be taught to place the forefinger of the left hand on top of, and at the right side of, the backsight. This is necessary in order to shut out light from the lamp over the top and between the backsight and the stem of the tangent sight. To lay a correct aim, the flat top of the blade which projects from the lower edge of the rectangular slit in the centre of the foresight will be used. The other features on the foresight may be ignored.

iii. To correct the line of sight.

No. 1 will make the necessary correction on the hand wheel and will then realign the sights by sliding the tangent sight up or down.

2. Use of the night aiming lamp.

i. There are two types, Mark II and Mark III.

If the Mark III, which is described in Pamphlet 7, Lesson 38, is in use, in combination with the clinometer, bar foresight, and night sights, one night aiming box is required per gun.

The Mark II box contains two aiming lamps, so that one box is required per two guns.

ii. Description of the Mark II lamp and box.

The folding handle on the side of the box must be opened before the box is opened. In removing the lamp it is necessary to take the lamp in one hand and the cable in the other to prevent the lamp being jerked and the connections carried away. In replacing, the word "TOP" on the lamps does not refer to their position in the box. Projecting strands of wire must not touch any terminal other than the one to which they are attached. No wire should touch terminals of the spare batteries.

iii. In paying out the cables from the drums:—

(a) Speed should not be attempted.

(b) Both should be unwound together.

(c) No loose coils of cable should be allowed to loop round the ends of the drum.

iv. Method of attaching the lamp to the aiming post.

v. Lighting, dimming and extinguishing the lamps.

(a) The method of using the switch.

(b) The switch must be turned off before the lamps are replaced in the box.

LESSON 42A.—TESTING AND ADJUSTING THE CLINOMETER

Instructor's Notes

Stores:—Gun, tripod, clinometer

1. To test the clinometer

i. Set the scale to zero.

ii. Place the clinometer on the gun, elevate or depress until the bubble is in the centre of its run.

iii Reverse clinometer and note position of the bubble.

(a) If central, the clinometer is in adjustment, but confirm at, say, 10 degrees depression and 10 degrees elevation.

(b) If displaced, this indicates that an error is present.

iv. In the case of (b) leave the clinometer on the gun and rotate the minute scale until the bubble is again central, then note the scale reading.

v. Having noted the variation from zero, halve it and set the scale to this point, *e.g.*, suppose that the reader points to 20 minutes E, remove clinometer and set scale to 10 minutes E.

vi. Replace on the gun and proceed as in ii and iii, above; if the bubble does not come central repeat the process.

NOTES.—

1. When rotating the minute drum always turn to the left last, *i.e.* anti-clockwise. Should an error be found, it will be seen that when the clinometer is truly horizontal there will be a variation in the zero reading. This error will be noted and the instrument adjusted as soon as possible.

2. If a gun is levelled with a clinometer known to be in adjustment, then any number of clinometers can be tested by placing them on the gun in the ordinary way and noting if there is any error.

2. To adjust the clinometer

Set the clinometer at the error noted. With the spanner loosen the "nuts securing micrometer collar," set the scale to zero and tighten up.

If the variation is large, it may be necessary to reset the degree reader. This is done by loosening the two securing screws and sliding the reader to the right or left, and then clamping up.

NOTE.—Except in an emergency, adjustments will be carried out only by armourers.

LESSON 43A.—TESTING THE NO. 9 MK. 1 DIRECTOR FOR ANGLE OF SIGHT

Instructor's notes

Stores :—Gun, tripod, dial sight, director.

1. Mount a gun, attach a dial sight known to be in adjustment, and lay with the tangent sight at zero (0) on a distant object. With the range drum of the dial sight at zero, level the bubble by means of the angle of sight drum and note the reading.

Mount the director at the same height as the gun (i.e., object glass on the same level as the tangent sight) and take angle of sight to distant object.

If this is the same as the reading on the angle of sight drum the director is in adjustment. If not, note the amount of error.

2. If a horizontal line is available (*see* para. 3 below), place the object glass at one end of the horizontal line and take the angle of sight to the other end. If this is zero the director is in adjustment, if not, note the error.

3. To lay out a horizontal plane, and test director for angle of sight

i. Select a position where there are two walls or upright posts, about 200 yards apart, and as far as possible in the same horizontal plane.

ii. Take director to one wall (A), if possible a corner of a house. Lay director at the other wall (B), and direct an assistant to make a mark on (B), which appears to have no angle of sight (i.e., an angle of sight of zero).

Make a mark on (A) level with the object glass.

iii. Take director to (B), mount it with object glass level with the mark, and lay it at mark on (A).

(a) If mark on (A) has no angle of sight, the two marks are on the same horizontal plane and the director is in adjustment.

(b) If the mark on (A) appears to show an angle of sight, make a second mark which has not.

(c) By measurement, make a third mark (X) on (A), midway between the two existing marks. (X) is on the same horizontal plane as the mark on (B).

iv. (a) Any director may now be tested for angle of sight and the errors, if any, noted.

(b) Adjustments will only be made by an armourer.

4. Practise squad.

NOTE.—Where an adjustment is necessary, it will be carried out by an armourer.

PART II

LESSON 56A.—CONTROLLED CORRECTIONS, INDIRECT

Instructor's Notes

Additional stores:—Bar foresight, aiming post.

Before this lesson, No. 1 must have received instruction in the use of the graduations on the hand wheel and in aiming over the bar foresight. He should have an elementary knowledge of the function of the aiming post.

The gun will be mounted, bar foresight affixed, and an aiming post planted about 10 yards in front of it. The sights will be set at 2500, and the instructor will lay the gun on the bull. The gun will be loaded and fire opened before the exercise begins.

To execute an order correcting the elevation when firing indirect.

“ Stop, All up (or down) . . . degrees . . . minutes, Go on.”

No. 1, using the graduations on the hand wheel, elevates or depresses the gun through the angle ordered. He readjusts his line of sight on to the bull by moving his tangent sight slide up or down.

LESSON 70A.—TO CONTINUE FIRING IN THE EVENT OF THE TARGET BECOMING OBSCURED

1. No change.
2. When the target is likely to be obscured for some time. Section commander orders gun aiming marks to be picked up as in para. 1.

He then orders **“ Indirect fire equipment.”**

Nos. 3 pass order back to Nos. 4.

Clinometers and aiming posts are taken from the truck, and handed to Nos 3 by the No. 4 of the odd sub-section.

Nos. 3 hand clinometers to Nos. 2.

At the first opportunity the section commander orders **“ Check elevation.”**

Nos. 1 relay on gun aiming mark.

Nos. 2 see that direction dial is at zero, and take elevation on the gun by clinometer.

Section commander.

“ Unload ”—“ Clear guns.”

Nos. 1 act as in Elementary gun drill.

(Continued on page 10)

SECTION 12.—TESTS OF ELEMENTARY GUN DRILL AND INSTRUMENTS

For Tests 7 (b) and (c) and 8 substitute:—

Name of test (1)	Conditions before test (2)	No. of tests (3)	Time allowed (4)	To pass (5)	Remarks (6)
7A (b) Indirect fire (elevation).	Gun loaded and laid on aiming post. Elevation checked by clinometer. Order to fire is given.	Three	6 seconds from command “ — minutes, Go on ” until No. 1 has pressed the thumbpiece.	Correct elevation within 2 minutes. Slide correctly adjusted.	Corrections will not exceed 45 minutes.
(c) Indirect fire (deflection).	The No. 2 to be tested will kneel by the barrel of the gun, hands to be clear of the bar foresight, which will be clamped on the gun, foresight at zero.	Three	6 seconds from command “ R or L — minutes.”	All three correct.	Corrections will be in degrees or tens of minutes.
8A (a) Clinometer.	Clinometer in its case and set at zero, rear cover open, gun approximately level.	One	20 seconds from the time an elevation is ordered until the elevation is placed on the gun.	Correct elevation within 2 minutes.	An order for elevation or depression of not more than 4 degrees will be given. The order will always include a multiple of 5 minutes. Switch to be not less than 40 degrees.
(b) Gun dial.	Gun mounted, laid on zero post. Dial at zero, and clamped.	One	5 seconds from command “ All R (or L) — degrees — minutes ” until the switch is completed and the clamp tightened.	Correct within 20 minutes.	

Section commander.

"Out aiming posts."

Nos. 1 close rear cover.

Nos. 3 plant aiming posts under the direction of No. 1.

Section commander.

"Load"—"Go on."

LESSON 71A.—TO MAKE PREPARATIONS IN DAYLIGHT TO CONTINUE FIRING IN DARKNESS

Instructor's Notes

Additional stores:—Clinometers, bar foresights, torches, aiming lamps and posts.

NOTE.—Section commander sends for section corporal and any night firing stores which are not already at the gun position.

Section commander.

"Prepare for night firing."

The section commander takes post at No. 1 gun, the section corporal at No. 2 gun.

No. 1 relays on target (or aiming post if firing indirect).

No. 2 sets dial at zero and takes the elevation on the gun with the clinometer. He attaches the bar foresight if not already on.

No. 4 of the odd sub-section brings up the night firing box and two torches, and hands one each to the section commander and the section corporal.

He places the night firing box between the sub-sections and lies down in rear of it, having first extracted the night sights and handed them to Nos. 2.

No. 2 fires the night sights and the section corporal reports to section commander "No. . . . Ready."

Section commander.

"Unload"—"Clear guns"—"Out aiming lamps."

No. 4 of the odd sub-section hands night aiming lamps to Nos. 3, who will move out in front of the guns, taking with them aiming posts if not already planted. They plant night aiming lamps under the direction of No. 1 and return by the flanks, reporting to the section commander when in.

Section commander orders "Load" and "Fire" as required.

LESSON 72A.—TO CHANGE FROM NIGHT FIRING TO DIRECT FIRE

Instructor's Notes

Additional stores:—As for Lesson 71.

Section commander.

"Prepare for direct fire."

"Unload"—"Clear guns."

"In aiming lamps."

No. 3 picks up the aiming post, holding the aiming post in one hand and the cable in the other. If the lights are on, No. 4 switches them off.

As No. 3 moves in, No. 4 winds in the cable. He should hold the body of the box between his knees, turn the handle with his right hand, and with his left hand lead the two cables regularly across the drum. Regularity in winding is essential.

No. 3 removes the lamp from the aiming post, hands it to No. 4, who replaces it in the box, closes the box and restores the folding handle to its slot.

Nos. 1 remove night backsights and hand them to Nos. 2.

Nos. 2 remove night foresights and bar foresights.

No. 4 of the odd sub-section collects the night sights from Nos. 2 and the torches from the section commander and section corporal, and replaces them in the truck or in a place of safety.

NOTE.—Aiming posts may be left in position and indirect fire equipment may be retained at the guns in readiness for smoke, etc.

NOTE.—In the following lessons, those actions which are different from the dial sight lessons in Pamphlet 7 are printed in thick type.

LESSON 73.—PREPARE FOR ACTION

Instructor's Notes

Additional stores:—Four section trucks and a megaphone.

On the order "Take post," the senior section commander will double forward to the gun position, placing himself on that flank which will be nearest to the platoon O.P. from which position he is responsible for the general duties on the gun position.

Junior section commander.

“ . . . belts—for indirect fire—prepare for action.”

The junior section commander will position himself midway and in front of the platoon, and supervise in general the “prepare for action.” Both section corporals supervising the work at their own trucks, finally joining their Nos. 4.

The action of each section will be as in section drill, direct fire.

In addition to their previous duties, Nos. 2 remove from the trucks clinometers and bar foresights, and sling them over their left shoulders. Nos. 3 take off aiming posts.

Sub-sections will be positioned by the junior section commander. When the stores have been removed from the trucks, and have been inspected and reported correct, the senior section corporal will :—

1. Send Nos. 4 to join the trucks.
2. Send the trucks to the position ordered.
3. Place himself and the junior section corporal in the most suitable position from which they can supervise in the communication between guns and trucks.

If a long carry is necessary, the same procedure as in section drill direct fire will be adopted, except that the junior section commander will detail loads.

LESSON 74A.—TO COME INTO ACTION

Senior section commander orders forward junior section commander and gives the following orders :—

Method of paralleling (position of director, if necessary) ivot gun, if any, gun position, frontage and direction.

Senior section commander.

“ Junior section commander.”

Junior section commander doubles forward and receives orders as above, from the senior section commander, doubles away to the opposite flank of the gun position, kneels down, and faces inwards.

Senior section commander.

“ For indirect fire—mount gun.”

Both section commanders will supervise the arrival of Nos. 1 of the nearest section, ensuring that the inner gun is the correct distance from him and staggered.

Nos. 1.—Double forward, mount their tripods on the positions as directed by the section commander. They stamp in the shoes of their tripods before sitting down.

Nos. 2, having mounted the gun, kneel on their left knees on the right side of the gun, and affix the bar foresights.

Nos. 3 carry out their duties as in section drill—direct fire.

LESSON 75A.—CEASE FIRING AND ON TRUCKS*Instructor's Notes*

Additional stores :—Four section trucks, one megaphone.

When this heading is being taught immediately after “To come into action,” it will first be necessary to have guns loaded in order that cease firing may be carried out correctly.

Fire controller signals :—“ Cease firing.”

Senior section commander acknowledges the signal. He then signals for “ Trucks.”

Senior section commander.

“ Unload—Clear guns ”—“ Cease firing.”

The movement will be carried out as in section drill direct fire, with the addition that Nos. 2 will remove bar foresights before the guns are dismounted.

Senior section commander.

“ On trucks.”

Each section will act as in “ On trucks ” in section drill, direct fire.

TO PARALLEL THE GUNS.

Section commanders will acknowledge all verbal orders by raising their hand, they repeat orders when necessary, and keep their hand raised if a repetition is required.

The guns are paralleled by one of the methods described in Part III, Sec. 25.

LESSON 76A.—DIRECTOR METHOD*Instructor's Notes*

Additional stores :—One director.

This method should be practised, using the director in different positions in relation to the guns.

Senior section commander.

"All—on director."

Nos. 1 lay on the director, and when laid, Nos. 2 set the dial at zero.

Junior section commander.—On designation of the first gun to receive its zero line, he will take up a position behind that gun. As each gun receives its zero line he will repeat the angle to the fire controller. He will then proceed along and in rear of the guns, checking each gun in turn for parallelism.

To do this he will stand behind the guns and glance along each barrel casing in turn. If there is a distant crest in front of the guns, the lines of fire of the four guns should be on approximately the same point. If no distant crest is available he will see where the line of fire of one gun crosses the crest in front and make own approximation from this as to where the others should cross right or left of it. He will report immediately to the senior section commander should any gun not appear to be parallel.

Platoon commander.

"Zero lines."

"No. . . . Right (or left) . . . deg. . . . mins."

"No. ,, ditto."

"No. ,, ditto."

"No. ,, ditto."

No. 2 swings the gun through the angle ordered and resets the dial at zero.

LESSON 77A.—POST METHOD

Instructor's Notes

Additional stores :—Two zero posts.

The **senior section commander** marks the position (with reference to the posts) over which the pivot gun will be mounted.

On the order "**For indirect fire—Mount gun**" the Nos. 1 and 2 of the pivot gun, align the gun on the posts, moving the tripod right or left until the line of sight through the tangent sight is in exact alignment of the posts. When this has been checked by the senior section commander Nos. 1 and 2 stamp in the tripod, the senior section commander re-checks the line of sight and ensures that the gun dial is set at 180°.

Senior section commander.

"All—on No. . . ."

Nos. 1 of the remaining guns lay on the socket of the pivot gun. When laid, Nos. 2 set their dials at zero.

Senior section commander.

Lays the pivot gun on to the socket of each gun in turn and orders

"Zero lines."

"No. . . . Right (or left) . . . deg. . . . mins."

"No. ,, ditto."

"No. ,, ditto."

Nos. 2 swing their guns through the angle ordered and reset the dials at zero.

No. 2 of the pivot gun finally swings his gun back to 180° and resets the dial at zero.

Junior section commander.—Takes up his position behind the gun farthest from the pivot gun, repeats the angle to the senior section commander, and checks for parallelism as in director method.

Senior section commander.—Reports to fire controller—"Guns on zero lines."

No. 3 of the pivot gun doubles forward and brings in the fire controller's posts.

LESSON 78A.—COMBINATION OF DISTANT AIMING POINT AND POSTS (OR TARGET)

Instructor's Notes

Additional stores :—Two zero posts and one director.

Senior section commander.—Selects the D.A.P. and with a director measures the angle D.A.P.—Posts (or target). The **junior section commander** doubles forward and receives orders including D.A.P., which the senior section commander will indicate by director. He then takes up his position as in director method.

Senior section commander.

"For indirect fire—Mount gun."

Guns are mounted as for director method. The pivot gun being mounted over the spot from which the senior section commander measured the angle D.A.P.—Posts (or target).

Senior section commander.

"All on D.A.P."

Nos. 1 lay on the D.A.P. Nos. 2 zero the dials.

"Zero lines—All right (or left) . . . deg. . . . mins."

Nos. 2 will swing the guns through the angle ordered, tighten the traversing clamp, and zero the dial.

Junior section commander.—Repeats the angle. Checks the line of all guns for parallelism.

Senior section commander.—Reports to fire controller—
“Guns on zero lines.”

No. 3 of the pivot gun doubles forward and brings in the fire controller's posts, if put out.

LESSON 79.—T.O.G. METHOD

No change.

LESSON 80A.—TO PLACE THE NECESSARY ELEVATION ON THE GUN

Fire controller.

“Elevation (or depression) No. . . . (or all) degrees . . . min.”

2

Nos. 1 act as taught in use of instruments.

To check crest clearance.

i. Near crest.

When the gun has been laid for elevation (or depression) Nos. 1 set their tangent sights at 400 yards, and see that the line of sight over the gun foresight clears the crest. If it does not they report to the section commander “No. . . . gun does not clear crest.”

ii. Distant crest.

Senior section commander.

“Check for crest clearance with sights at . . .”

(For method of obtaining this range see Sec. 25, Lesson 115.)

No. 1 sets the tangent sight at the graduation ordered and proceeds as in (i) above.

Senior section commander.

“Out aiming posts.”

Nos. 3 plant aiming posts as directed by Nos. 1.

After aiming posts have been planted, Nos. 1 test the adjustment of their clamps, finally relaying on the bull.

Senior section commander.

“Guns ready to load.”

Fire controller.

“Load.”

LESSON 81A.—DISTRIBUTION AND CORRECTIONS

Fire controller.

“Distribution.”

No. Nil.

No. Right (or left) . . . degrees . . . minutes.

No. “ ” ”

No. “ ” ”

No. 2 sets the bar foresight at the angle ordered.

No. 1 taps the gun across until his line of sight is on the aiming post.

If distribution is ordered, Nos. 1 and 2 check elevation as follows:—

No. 1 raises the rear cover.

No. 2 places the clinometer on the outside plates and levels the bubble by turning the hand wheel.

No. 1 adjusts his tangent sight slide so that the line of sight is on the aiming post and notes the reading.

TO TAP RIGHT AND LEFT.

Fire controller.

“Right and left . . . taps.”

After this order has been received, Nos. 2 indicate guns ready to fire. When all guns are ready, section commanders indicate to fire controller.

The right section will tap first to the left, and the left section will tap first to the right, by the amount ordered.

TO MAKE ALLOWANCE FOR SIDE WINDS.

Fire controller.

“Wind right (or left) . . . degrees . . . mins.”

No. 2 sets the bar foresight at the amount ordered. (If the bar foresight is not at zero he adds or subtracts this amount to or from the angle on the bar foresight.)

No. 1 taps the gun over until the line of sight is on the aiming post.

As soon as guns are relaid Nos. 2 and section commanders will indicate guns ready to fire.

Fire controller signals or orders: “Fire.”

Section commanders and Nos. 2 lower their hands.

Nos. 2 ordering fire if necessary.

Nos. 1 fire.

Fire controller signals: “Stop.”

Section commanders—repeat.

Nos. 2 repeat “Stop.”

Nos. 1 stop.

CORRECTIONS DURING FIRING.

NOTE.—Any corrections during firing, signalled by the fire controller, must first be repeated by the senior section commander, before being given verbally to the guns.

i. DIRECTION.

Fire controller.

“Stop.” “All right (or left) . . . degrees . . . mins.”

“Go on.”

Nos. 2 alter bar foresight accordingly.

Nos. 1 relay and carry on firing.

ii. ELEVATION.

Fire controller.

“Stop”—“All up (or down) . . . min.” “Go on.”

Nos. 1 act as taught in “controlled corrections—indirect” (if the correction ordered is down, they will re-check for crest clearance).

Nos. 2 add or subtract the angle ordered to or from the setting on the clinometer.

NOTE.—Elevation *must* be given as a quadrant angle, and not as a combination of range and angle of sight.

LESSON 82A.—TO ENGAGE A NEW TARGET

Fire controller.

“Stop. All on zero lines.”

No. 2 sets the bar foresight at zero.

No. 1 relays on aiming post.

No. 2 sees that the dial is at zero.

Fire controller.

“All—Right (or left) . . . deg. . . . mins.”

(a) Where the angle ordered can be put on bar foresight—No. 2 sets bar foresight at angle ordered.

(b) Where the angle ordered cannot be put on bar foresight—No. 2 swings the gun through the angle ordered by means of the direction dial.

Fire controller.

“Elevation (or Depression)—No. . . . (or all). . . deg. . . . mins.”

Elevation or depression is placed on the gun as before.

(a) Where the angle of switch ordered can be put on bar foresight—

No. 1 readjusts his line of sight on to his aiming post.

He ascertains whether his gun will clear the crest and the aiming post.

(b) When the angle of switch ordered cannot be put on the bar foresight—

Platoon commander—“Unload”—“Clear guns”—“Out aiming posts”—“Load,” etc.

Or platoon commander orders No. 1 to pick up a gun aiming mark and then continues with the fire order.

LESSON 83.—FIRE CONTROL CHARTS

No change.

SECTION 19.—SECTION DRILL.—NIGHT FIRING

Instructor's Notes

Stores :—Two guns, two tripods, two spare parts cases, two condenser cans, two condenser tubes, two clinometers, two bar foresights, one night aiming box Mark II (or two boxes Mark III), two aiming posts, 5 ammunition boxes, belts and dummies.

Both section commander and corporal will be in possession of a torch.

The object of section drill—night firing—is to teach and exercise the section personnel in their drill duties as a fire unit by night.

LESSON 84A.—PREPARE FOR ACTION AND COME INTO ACTION

Instructor's Notes

Additional Stores :—Two section trucks.

Section corporal.

“ . . . Belts—for night firing—Prepare for action.”

All duties are the same as for “For indirect fire—Prepare for action,” except that gun Nos. will remain with their equipment in file in front of the trucks. No. 4 of the odd-numbered sub-section removes the aiming lamps and aiming posts. (Nos. 3 will not remove aiming posts.)

The section corporal is responsible that all the necessary stores have been removed from the trucks. He will then detail loads and move the section forward to a position in rear of the gun pegs.

TO COME INTO ACTION.

Section commander (or section corporal).

"No. . . . For night firing—Mount gun."

No. 1 moves forward with his tripod to a position pointed out to him by the section commander or section corporal a few feet in rear of the gun peg. He mounts his tripod, removes the crosshead, and with the assistance of the section commander or section corporal places the tripod so that the cross-wires are directly above the peg. He stamps in the shoes, and after the section commander or section corporal has satisfied himself that the mounting is directly above the gun peg. No. 1 replaces the crosshead.

He calls up No. 2.

No. 2 mounts gun on tripod, fixes the bar foresight and the night firing sights when the latter are handed to him by No. 4.

No. 3 brings forward aiming post, condenser and one ammunition box. He places the condenser and ammunition beside the gun in the normal manner and proceeds to the centre of the section with the aiming post.

No. 4 of the odd sub-section brings forward the night firing box, places it between the two guns, hands the night firing sights to No. 2, and lies down in rear of the box. He accompanies the section commander to the direction pegs when ordered to do so.

LESSON 85A.—TO OBTAIN DIRECTION AND ELEVATION

TO LAY THE GUN IN THE REQUIRED LINE

Section commander

"No. . . . Direction."

No. 1 of the gun named aligns gun on lamp.

No. 2 sets the dial at zero.

The section corporal checks the line and dial of each gun in turn, reporting "No. . . . correct" as soon as he has finished.

TO GIVE ELEVATION TO THE GUN

Section commander.

"Elevation (or Depression) . . . deg. . . . mins."

Nos. 1 and 2 place elevation on the gun (assisted by supervising N.C.O.).

No. 1 sets sight at 2,500.

TO PLANT AIMING LAMPS

Section commander.

"Out aiming lamps."

No. 4 unfolds the handle, opens the box and hands the lamp to No. 3, who places it on the aiming post. No. 3 holds the aiming post in one hand and the cable in the other.

No. 4 unwinds the cable and No. 3 moves on to the line of direction of the gun.

No. 4 switches on the light, and No. 1 directs No. 3, verbally, as to the planting of the aiming lamp, as when planting the aiming post.

After the lamp has been planted No. 3 moves in round flank and reports to section commander when in.

Note.—The remainder of the drill in action is as for "Indirect fire."

LESSON 86A.—CEASE FIRING AND ON TRUCKS

Instructor's Notes

Additional stores.—Two section trucks.

Section commander.

"Unload"—"Clear gun"—"In aiming lamps."

Nos. 1, 2, 3 and 4 carry out their duties as in Lesson 72A.

Section commander.

"Cease firing."

Gun numbers will act as in Lesson 66, Section drill—Direct fire.

After the guns have been dismounted, the section commander will fall in the section, and check stores. He is himself responsible for the pegs.

The section will move back to the trucks led by the section corporal, the section commander moving in rear; on arrival the section commander orders "On trucks."

This drill will be carried out as in section drill, direct fire, except that No. 4 of the odd sub-section will replace the aiming post and aiming lamp in the trucks. The section commander will place the zero posts and pegs in his truck until such times as they can be transferred to the platoon commander's truck.

LESSONS 87 TO 94

No change.

PART III

LESSON 95—ELEVATION

No change, but note that when clinometers are used, elevation must be given to the guns as a quadrant angle.

LESSONS 96 TO 105

No change.

LESSON 106.—FIRE ORDERS—INDIRECT

Note that when clinometers are used, elevation must be given as a quadrant angle, and lifts as an angle.

LESSON 107.—GENERAL PRINCIPLES

Para. 1, iii, does not apply.

LESSON 108A.—THE DIRECTOR METHOD

Para. 2, iii. substitute:—

“iii. Release the index plate clamp and lay on the socket of each gun in turn.

Read the angle for each gun off the degree scale and give it out to the gun concerned.

Each gun lays on to the director and it zeroes its dial. The guns are then switched through the angles ordered, and will then be on lines parallel to the initial line on which the director is laid.”

Para. 3.—The explanation of the theory of the director method applies to the use of the dial sight, but the same result is obtained by the means described above.

(NOTE.—The names of the parts of the director mentioned in this para. refer to the No. 4 Director. When using the No. 9 Director, the principle is the same though the names of the parts are different.)

LESSON 109.—DIRECTOR TO THE FLANK OF THE LINE OF FIRE

It has been decided to discontinue the teaching of this method during the war.

LESSONS 110 AND 111

The difference in procedure when the dial sight is not used is explained in Lessons 79A and 78A.

LESSONS 112 AND 113

No change.

LESSON 114.—OBTAINING ELEVATION

Para. 3. As already explained, only the “quadrant angle” method is possible with the clinometer.

LESSONS 115 AND 116

No change.

LESSON 117A.—RECONNAISSANCE BY DAY
(ONE TARGET ONLY)*Instructor's Notes*

Stores:—Gun pegs, direction pegs, and directors.

Method of instruction:—

A simple tactical situation will be defined and the procedure explained. The squad will practise putting out pegs both in front and in rear of the gun position.

1. Mark the position of each gun by a small post (gun peg).

Place a second post (direction peg) for each gun in direct alignment of the gun peg and the position on the target for the gun concerned.

When the guns are brought up the procedure is as described in section drill—night firing.

To avoid exposing personnel in front of the gun line, it may often be desirable to place the direction pegs in rear of the gun pegs. In this case it will be necessary to screen the aiming lamps from the front when giving direction to the guns.

When the guns are being given direction from direction pegs in rear, they are laid with their dials at 180 degrees on the aiming lamps held over the pegs. They are then swung round to 0 degrees and aiming lamps planted in the normal way.

LESSON 118A.—RECONNAISSANCE BY DAY
(TWO OR MORE TARGETS)*Instructor's Notes*

Stores:—As for Lesson 117, with the addition of slide rules and range tables.

Method of instruction:—

The instruction will be developed from Lesson 117, so as to include placing guns on parallel zero lines.

Here it is necessary to plant gun and direction pegs for each gun on parallel zero lines, so that the guns can be switched. The direction pegs may be in front of or behind the gun pegs.

Gun pegs are planted for each gun. A zero line is selected and a direction peg for the pivot gun aligned on it.

Where a distant aiming point is available (Lesson 111), with a director measure the angle between the distant aiming point and the zero line for the pivot gun. Mount the director in turn over the remaining gun pegs, lay this angle off the aiming point and place the direction peg in this line.

Where no distant aiming point is available, the following method may be adopted. The procedure is described for two guns only, but can be extended to include four guns if required.

Plant gun pegs for each gun (G_1 , G_2) (Fig. 35A).

Place a direction peg (P_1) on the zero line for the pivot gun, either in front of or behind the gun position.

Measure the distance between the gun pegs (G_1 , G_2) either by pacing or with tape or string.

By means of the V.I. graph calculate the angle $G_1T_1G_2$, i.e., the angle subtended at the range G_1T_1 by the distance G_1G_2 .

Set up the director over the other gun peg (G_2) and lay it on T_1 with the arrow at 0 degree. Lay off the angle found above right or left as required (left in case shown), and place a direction peg (P_2) on this line.

If more convenient, the angle T_1G_2B can be laid off by means of graticuled glasses or by any other means of measuring accurate lateral angles.

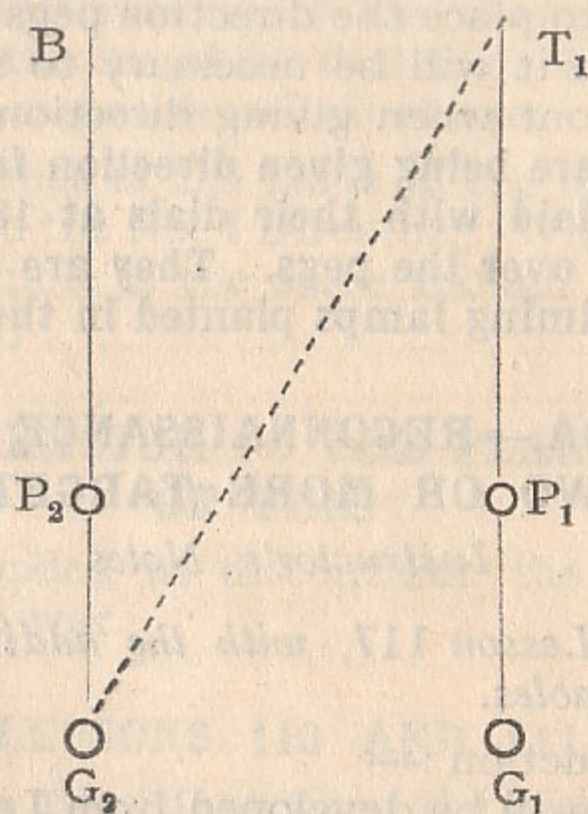


FIG. 35A.

LESSON 119A.—RECONNAISSANCE BY DAY (INDIRECT FIRE)

Instructor's Notes

Stores :— *As for Lesson 118.*

Method of instruction :—

Instruction will be developed from Lesson 118 to include the observation post.

Explain.—

When the targets are not visible from the gun position to be occupied, but are visible from an observation post within voice control of the gun position, the following will be the procedure :—

Gun pegs are planted for each gun. **Direction pegs on parallel zero lines are then placed in position by any of the indirect means already described.**

If the director or post method is employed, two directors should be used.

In the director method the second director is mounted over each gun peg in turn and lays off the angle measured by the other director for that gun. The direction peg is then placed in this line.

In the post method, one director will be mounted over the gun peg for the pivot gun, the other being mounted over each of the remaining gun pegs in turn.

LESSON 120A.—RELIEF OF GUNS BY NIGHT

Instructor's Notes

Stores :— *Two or more guns, and tripods, clinometers and bar foresights, gun pegs, aiming lamps, aiming posts.*

Method of instruction :—

Guns will be in position laid for direction and elevation.

The procedure of relief will be carried out in detail.

Where opportunity offers, from this lesson can be developed the full process of occupation and relief by two separate sections.

Explain :—

i. The N.C.O. i/c the relieving gun will supervise a gun peg being placed accurately under the socket of the gun to be relieved. To do this the gun and crosshead will be removed.

ii. The gun to be relieved will then be removed, and the relieving gun mounted accurately over the gun peg and laid on the aiming lamp.

iii. When both guns of the relieving section are laid for direction, the aiming lamps will be removed and replaced by those of the relieving section.

iv. Fire control charts and other information will be handed over.

LESSON 123A.—T.O.G.

Reference Lesson 123 in Pamphlet 7.

Para. 1, i, lines 11 to 17, *substitute* :—

“At the guns.

The pivot gun is used to place the remaining guns on lines parallel to G₁0 by the method described in Lesson 79.”

LESSON 124A.—PREPARATION OF CHARTS

Fire control chart on Page 86 in Pamphlet 7, Part III.

Note that, in the column headed “Normal Range or Q.A.,” only Q.As. will be used, including the necessary angular lifts (up or down) demanded by the combined sight rule. The column headed “Angle of sight” will not be used.

SECTION 30A.—EXAMPLES OF INDIRECT FIRE ORDERS

Elevation will be given as a Q.A. and not as a combination of range and angle of sight, e.g. :—

Example 1.

For “All—sixteen hundred plus 25 minutes” *substitute* “Elevation, All two degrees four owe minutes.”

For “All down—fifty” *substitute* “All down—five minutes (Lift for 50 yards at 1,600 is 7 minutes).”

For “All up one hundred” *substitute* “All up—one owe minutes.” (Twice the lift given above.)

LESSON 130A.—LAYING A FIXED LINE (FLANKING FIRE) AS NEAR AS IS SAFE TO A DEFENDED LOCALITY

Instructor's Notes

Stores :—Gun, tripod, belt, belt box, dummy cartridges, bar foresight, clinometer, aiming post.

For para. ii *substitute* :—

“ii. Set this angle on the bar foresight and lay on the defended locality.”

For para. vii *substitute* :—

“vii. Reset the bar foresight at zero, and set zero on the gun dial.

The gun is now laid on its fixed line.”

For para. viii *substitute* :—

“viii. By means of the clinometer, find the Q.A. for the fixed line (see Lesson 31.A, 3). Replace the clinometer in its case set at that reading.”

For para. ix *substitute* :—

“ix. Set the target sight at 2,500, and plant an aiming post.”

LESSON 131A.—LAYING A FIXED LINE (OVERHEAD FIRE) AS NEAR AS IS SAFE TO A DEFENDED LOCALITY: EACH GUN COVERING 50 YARDS OF FRONT

Instructor's Notes

Stores :—As for Lesson 130.A. and, in addition, slide rule and range table.

Explain and demonstrate :—

i. Order the range-taker to take the range to any defended locality over which fire will have to pass.

ii. From the slide rule or range table ascertain the minimum range which will ensure the safety of the troops in the defended locality (i.e., the equivalent range).

iii. Convert 25 yards to an angle at the latter range.

iv. Set this angle on the bar foresight of each gun, No. 1—Right, No. 2—Left.

v. Lay both guns on to the defended locality.

vi. Set the range obtained in (ii) above on the tangent sight of each gun.

vii. Relay on to the defended locality.

viii. Record the elevation on each gun by means of the clinometer (Lesson 31.A, 3).

ix. Set bar foresights to zero, set sights to 2,500 and plant aiming posts.

x. Half load and press thumbpiece.

xi. Determine the number of taps required for each gun to cover 25 yards right and left at the range obtained in (ii) above.

NOTE.—No lifts will be given.

It may be necessary to consider also flanking safety for one or more defended localities.

LESSON 132A.—LAYING A FIXED LINE WHEN NO RECONNAISSANCE BY DAY HAS BEEN CARRIED OUT

Para. ii (c) substitute :—

“(c) By means of the clinometer, find the Q.A.
Replace the clinometer in its case at that reading.”





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